

## PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION OF ELECTION  
(PCT Rule 61.2)

To:

Commissioner  
US Department of Commerce  
United States Patent and Trademark  
Office, PCT  
2011 South Clark Place Room  
CP2/5C24  
Arlington, VA 22202  
ETATS-UNIS D'AMERIQUE  
in its capacity as elected Office

Date of mailing (day/month/year) 23 February 2001 (23.02.01)	
International application No. PCT/FI00/00555	Applicant's or agent's file reference 50063
International filing date (day/month/year) 21 June 2000 (21.06.00)	Priority date (day/month/year) 21 June 1999 (21.06.99)
Applicant OLKKONEN, Mikko et al	

1. The designated Office is hereby notified of its election made:

in the demand filed with the International Preliminary Examining Authority on:

15 January 2001 (15.01.01)

in a notice effecting later election filed with the International Bureau on:

\_\_\_\_\_

2. The election  was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No.: (41-22) 740.14.35	Authorized officer  F. Baechler  Telephone No.: (41-22) 338.83.38
---	---

## PATENT COOPERATION TREATY

10/018226

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF THE RECORDING  
OF A CHANGE(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

Date of mailing (day/month/year)  
10 January 2002 (10.01.02)

To:

BERGGREN OY AB  
P.O. Box 16  
FIN-00101 Helsinki  
FINLANDE

Applicant's or agent's file reference  
50063

## IMPORTANT NOTIFICATION

International application No.  
PCT/FI00/00555

International filing date (day/month/year)  
21 June 2000 (21.06.00)

## 1. The following indications appeared on record concerning:

the applicant     the inventor     the agent     the common representative

## Name and Address

NOKIA NETWORKS OY  
P.O. Box 300  
FIN-00045 Nokia Group  
Finland

State of Nationality FI	State of Residence FI
----------------------------	--------------------------

Telephone No.

Facsimile No.

Teleprinter No.

## 2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

the person     the name     the address     the nationality     the residence

## Name and Address

NOKIA CORPORATION  
Keilalahdentie 4  
FIN-02150 Espoo  
Finland

State of Nationality FI	State of Residence FI
----------------------------	--------------------------

Telephone No.

Facsimile No.

Teleprinter No.

## 3. Further observations, if necessary:

## 4. A copy of this notification has been sent to:

the receiving Office  
 the International Searching Authority  
 the International Preliminary Examining Authority

the designated Offices concerned  
 the elected Offices concerned  
 other:

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

François BAECHLER

Telephone No.: (41-22) 338.83.38

004583960

# PATENT COOPERATION TREATY

SKO / PKK

NOKIA  
NETWORKS

**PCT**

From the  
**INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY**

To:

BERGGREN OY AB  
P.O. Box 16  
FIN-00101 Helsinki  
FINLANDE

*Berggren Oy Ab*  
25 -09- 2001

## NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing (day/month/year)	20.09.2001
-------------------------------------	------------

Applicant's or agent's file reference  
50063

### IMPORTANT NOTIFICATION

International application No.  
PCT/FI00/00555

International filing date (day/month/year)  
21/06/2000

Priority date (day/month/year)  
21/06/1999

Applicant

NOKIA NETWORKS OY

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

#### 4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/

European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized officer

Barrio Baranano. A  
Tel.+49 89 2399-8621



# PATENT COOPERATION TREATY

From the:  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

BERGGREN OY AB  
P.O. Box 16  
FIN-00101 Helsinki  
FINLANDE

*Berggren Oy Ab*

16 -05- 2001

*SICU /IPKE*

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing  
(day/month/year)

14.05.2001 *19/8-01*

*pwk*

Applicant's or agent's file reference  50063	REPLY DUE	within 3 month(s) from the above date of mailing
International application No.  PCT/FI00/00555	International filing date (day/month/year)  21/06/2000	Priority date (day/month/year)  21/06/1999
International Patent Classification (IPC) or both national classification and IPC  H04L12/66		
Applicant  NOKIA NETWORKS OY		

1. This written opinion is the first drawn up by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I    Basis of the opinion
- II    Priority
- III    Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV    Lack of unity of invention
- V    Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI    Certain document cited
- VII    Certain defects in the international application
- VIII    Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

**When?** See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

**How?** By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

**Also:** For an additional opportunity to submit amendments, see Rule 66.4. For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis. For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 21/10/2001.

Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer / Examiner  Hamer, J
	Formalities officer (incl. extension of time limits)  Barrio Baranano, A Telephone No. +49 89 2399 8621



**I. Basis of the opinion**

1. With regard to the **elements** of the international application (Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"):

**Description, pages:**

1-9                   as originally filed

**Claims, No.:**

1-19                  as originally filed

**Drawings, sheets:**

1/4-4/4              as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description,        pages:
- the claims,           Nos.:

the drawings, sheets:

5.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement  
Novelty (N)                      Claims 1-19  
Inventive step (IS)              Claims 1-19  
Industrial applicability (IA)    Claims

2. Citations and explanations  
**see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**

The claims of the application appear to meet the requirements of Articles 33(2) and (3) PCT. More details will be given in the written report. Nevertheless, the following defects are present in the application.

**VII- Certain Defects**

- a) The claims do not meet the requirements of Rule 6.2(b) PCT in that they do not contain reference signs.
- b) The independent claims do not meet the requirements of Rule 6.3(b) PCT in that they are not divided into the two-part form.
- c) The most relevant of the documents cited in the International Search Report should be referenced and briefly discussed in the description, Rule 5.1(a)(ii), PCT.

for transmitting voice using so called internet telephony. As the data transmission capacity of the Internet increases, the use of Internet as a replacement of conventional telephones will become common. Some telephone operators already provide long distance calls via the Internet with a reduced rate.

5 Publication WO 9914929 discloses method and apparatus for placing long distance telephone calls via a packet data network and local telephone calls via local telephone network, the user of the telephone set plainly dialling the desired destination number. The routing of the call via either packet data network or telephone network is based on the destination number.

10

Publication WO 9904540 discloses a system for establishing communication between two endpoints connected to each other via two communication media, for example Ethernet and ATM (Asynchronous Transfer Mode), operating in accordance with different communication protocols. A connection controller selects 15 a connection path connecting the two endpoints and configures the endpoints and an interface between the two communication media to establish a connection before any data is sent using the connection path.

Publication WO 9716007 discloses a telecommunication system, where it is possible 20 to transmit calls between terminals using a packet switched network or a packet switched network and telephone network. There is a gateway connecting a packet switched network to telephone network. A first connection is typically set up between a first terminal and the gateway via, for example, the packet switched network and a second connection is set up between a second terminal and the 25 gateway via the telephone network.

2a

Figure 1 illustrates one possible arrangement for transmission of speech using an IP network together with a telephone network. Figure 1 shows switching elements 10a, 10b, 10c of the telephone network being connected to each other with PCM communication links 12. Further, figure 1 shows an IP network 40, and routers 30 connected to the IP network. Network elements such as IP gateways 20 connect the switching elements 10a, 10b, 10c to the routers 30. Without using the IP network, speech data from a first party PARTY A of a connection to a second party PARTY B is transferred using the PCM connections 12. The call may pass through a large number of switching elements, depending on the geographical distance spanned by the call. When the IP network 40, such as the Internet network is used, a switching element directs the speech data to an IP gateway instead of another switching element, and the IP gateway sends the speech data through the IP network to distant IP gateway connected to a distant switch element. The distant IP gateway converts the received IP packets to a speech data stream and forwards the data stream to the distant switch element for further processing. One or more legs of a call may be routed in such a way through an IP network.

One example of the proceeding of call setup according to prior art is illustrated in figure 2. Figure 2 shows the local telephone exchange 5 of a calling party PARTY A and switching elements 10a, 10b, 10c of the telephone network. First, the calling party initiates the call, whereby the local telephone exchange sends 100 an ISUP SETUP message to the next switching element 10a. The switching element 10a performs digit analysis 105 to determine, where the call should be directed. In this example, the digit analysis reveals, that the next switching element SW B 10b is an IP capable switch. As a consequence, switching element SW A 10a sends an ISUP SETUP message 110 to switching element SW B 10b. The switching element SW A 10a may include in the message an indication that it wishes to set up an IP connection, for example as a parameter specifying an IP address corresponding to the IP gateway of switch element SW A. The switching element SW B 10b responds by sending 115 a message such as a CHANNEL INFO message specifying an IP address corresponding to the IP gateway connected to switch element SW B. After receiving the IP address, switching element SW A may start sending 120 speech data to switching element B via the IP gateways and the IP network. After sending

the CHANNEL INFO message, the switching element SW B performs digit analysis 125 to determine, where it should direct the call. In this example, the digit analysis reveals that the next switching element is switching element SW C 10c, and that SW C is IP capable. As a consequence, switching element SW B 10b sends an ISUP 5 SETUP message 130 to switching element SW C 10c. The switching element SW B 10b may include in the message an indication that it wishes to set up an IP connection, for example as a parameter specifying an IP address corresponding to the IP gateway of switch element SW B. The switching element SW C 10c responds by sending 135 a message such as a CHANNEL INFO message specifying an IP 10 address corresponding to the IP gateway connected to switch element SW C. After receiving the IP address, switching element SW B may start sending 140 speech data to switching element C via the IP gateways and the IP network.

The resulting situation is not optimal regarding the efficiency of data transfer: switching element SW B receives a speech data stream from the IP network, and 15 returns the speech data stream back to the network for forwarding to switching element SW C.

The same situation may occur also in a cellular telecommunication network, in which case the switching elements 10a, 10b, 10c are switching elements of a cellular telecommunications network, such as mobile services switching centers (MSC) of a 20 GSM (Global System for Mobile communications) or a UMTS (Universal Mobile Telecommunication System) network. In a cellular telecommunication network such a situation may also occur as a result of a inter MSC handover, for example when a mobile station (MS) under control of MSC SW B moves to an area under control of MSC SW C, while having a connection to a mobile station under control of MSC 25 SW A.

#### SUMMARY OF THE INVENTION

An object of the invention is to realize a method, which alleviates the problems associated with prior art. A further object of the invention is to realize such a method with minimal changes to existing protocols.

30 The objects are reached by arranging a switching element to monitor the connections, and initiate a connection release procedure, when it observes that both the incoming and outgoing leg of a connection are transmitted via a packet data network. The switching element also indicates to the originating switching element

advantageous in terms of ease of control of connections, and allows all control functions of the circuit switched network such as billing to be used despite the use of a packet data network as a part of the data transfer route.

The term user data connection in the attached patent claims therefore covers the user data connection in such systems, in which user data connections and control connections are separate. Further, the term user data connection covers the transmitted connection in systems, in which there is no separation between the payload and control aspects of a connection. Further, the user data connection can transfer speech data, images, video data, fax data, or any other type of data transferred in a circuit switched connection.

In this specification and in the attached patent claims, the term leg of a connection refers to a part of a connection from one switching element of a telephone network to another.

The IP addresses used in various embodiments of the invention may be IPv4 addresses described in detail in the specification RFC 791, or IPv6 addresses described in the specification RFC 1883. The invention can be used with both IP version 4 and IP version 6 networks, as well as other packet data networks.

The name of a given functional entity, such as the base station controller, is often different in the context of different cellular telecommunication systems. For example, in the UMTS (Universal Mobile Telecommunication System) system the functional entity corresponding to a base station controller (BSC) is the radio network controller (RNC). Therefore, the particular terminology used to denote various functional entities in this specification are only examples according to the GSM system, and do not limit the invention in any way. Further, the various command and message names such as the CHANNEL INFO message name are intended to be examples only, and the invention is not limited to using the command and message names recited in this specification.

In view of the foregoing description it will be evident to a person skilled in the art that various modifications may be made within the scope of the invention. While a preferred embodiment of the invention has been described in detail, it should be apparent that many modifications and variations thereto are possible, all of which fall within the true spirit and scope of the invention as defined in the appended claims.

**Claims**

1. Method for optimizing data transmission in a telephone network, characterized in that the method comprises at least steps, in which

- a first switching network element (10b) examines (200, 305, 310), if the incoming leg of a user data connection is transmitted from a second switching network element (10a) via a packet data network and if the outgoing leg of the same user data connection is transmitted to a third switching network element (10c) via said packet data network,
- if both the incoming and the outgoing legs are transmitted via said packet data network, said first switching network element indicates (210, 320) to one of said second and third switching network elements an address of said packet data network corresponding to the other of said second and third switching network elements.

2. A method according to claim 1, characterized in that the method further comprises a step, in which said first switching network element releases (240, 325)

- 15 the user data connection between said first switching network element and said one of said second and third switching network elements.

3. A method according to claim 1, characterized in that said one of said second and third switching network elements is said second switching network element and

- 20 said other of said second and third switching network elements is said third switching network element.

4. A method according to claim 1, characterized in that said packet data network is an IP network and said address of said packet data network is an IP address.

- 25 5. A method according to claim 4, characterized in that said address of said packet data network is an IPv4 address according to RFC 791.

6. A method according to claim 4, characterized in that said address of said packet data network is an IPv6 address according to RFC 1883.

- 30 7. A method according to claim 1, characterized in that said address corresponding to said one of said second and third switching network elements is indicated to said other of said second and third switching network elements switching element using (210) a call control release message.

8. A method according to claim 7, **characterized** in that said indication is attached (210) to a ISUP RELEASE message.
9. A method according to claim 1, **characterized** in that said connection is a speech data connection.
- 5 10. A method according to claim 1, **characterized** in that said switching network element is a network element of a cellular telecommunications network.
11. A method according to claim 1, **characterized** in that said switching network element is a MSC of a cellular telecommunications network.
- 10 12. A method according to claim 11, **characterized** in that said switching network element is a MSC of a GSM network.
13. A method according to claim 11, **characterized** in that said switching network element is a MSC of a UMTS network.
14. A switching network element (400) of a telephone network, **characterized** in that the network-element-comprises-at-least

---

  - 15 - means (453) for examining the incoming and outgoing legs of connections and for producing an output if both said legs of a connection are transmitted via a packet data network instead of a circuit-switched connection,
  - means (454) for indicating a packet data network address corresponding to one of the switching network element at the receiving end of said outgoing leg and the switching network element at the originating end of said incoming leg to the other of the switching network element at the receiving end of said outgoing leg and the switching network element at the originating end of said incoming leg as a response to said output, and
  - means (455) for sending a connection release message as a response to said output to said one of the switching network element at the receiving end of said outgoing leg and the switching network element at the originating end of said incoming leg.
- 20 15. A switching network element according to claim 14, **characterized** in that said one of the switching network element at the receiving end of said outgoing leg and the switching network element at the originating end of said incoming leg is the switching network element at the receiving end of said outgoing leg; and said other of the switching network element at the receiving end of said outgoing leg and the switching network element at the originating end of said incoming leg is the switching network element at the originating end of said incoming leg.

**PCT REQUEST**

50063

Original (for **SUBMISSION**) - printed on 21.06.2000 09:56:29 AM

0 0-1	For receiving Office use only International Application No.	
0-2	International Filing Date	
0-3	Name of receiving Office and "PCT International Application"	
0-4 0-4-1	Form - PCT/RO/101 PCT Request Prepared using	<b>PCT-EASY Version 2.90 (updated 10.05.2000)</b>
0-5	<b>Petition</b> The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	<b>National Board of Patents and Registration (Finland) (RO/FI)</b>
0-7	Applicant's or agent's file reference	<b>50063</b>
I	Title of invention	<b>CALL SETUP METHOD</b>
II II-1 II-2 II-4 II-5  II-6 II-7 II-8 II-9	Applicant This person is: Applicant for Name Address:  State of nationality State of residence Telephone No. Facsimile No.	applicant only all designated States except US NOKIA NETWORKS OY P.O. Box 300 FIN-00045 Nokia Group Finland FI FI +358-9-51121 +358-9-51168080
III-1 III-1-1 III-1-2 III-1-4 III-1-5  III-1-6 III-1-7	Applicant and/or Inventor This person is: Applicant for Name (LAST, First) Address:  State of nationality State of residence	applicant and inventor US only OLKKONEN, Mikko Tähtelänpolku 3 FIN-10210 Inkoo Finland FI FI

**PCT REQUEST**

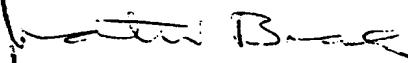
Original (for SUBMISSION) - printed on 21.06.2000 09:56:29 AM

III-2	<b>Applicant and/or Inventor</b>	
III-2-1	This person is:	<b>applicant and inventor</b>
III-2-2	Applicant for	<b>US only</b>
III-2-4	Name (LAST, First)	<b>HARNO, Jarmo</b>
III-2-5	Address:	<b>Hiidenportti 12 B FIN-02750 Espoo Finland</b>
III-2-6	State of nationality	<b>FI</b>
III-2-7	State of residence	<b>FI</b>
IV-1	<b>Agent or common representative; or address for correspondence</b>  The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: Name	<b>agent</b>
IV-1-1	Name	<b>BERGGREN OY AB</b>
IV-1-2	Address:	<b>P.O. Box 16 FIN-00101 Helsinki Finland</b>
IV-1-3	Telephone No.	<b>+358-9-693701</b>
IV-1-4	Facsimile No.	<b>+358-9-6933944</b>
IV-1-5	e-mail	<b>email.box@berggren.fi</b>
V	<b>Designation of States</b>	
V-1	Regional Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	<b>AP: GH GM KE LS MW MZ SD SL SZ TZ UG ZW and any other State which is a Contracting State of the Harare Protocol and of the PCT EA: AM AZ BY KG KZ MD RU TJ TM and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT EP: AT BE CH&amp;LI CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE and any other State which is a Contracting State of the European Patent Convention and of the PCT OA: BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG and any other State which is a member State of OAPI and a Contracting State of the PCT</b>
V-2	National Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	<b>AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH&amp;LI CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW</b>

## PCT REQUEST

50063

Original (for SUBMISSION) - printed on 21.06.2000 09:56:29 AM

V-5	<b>Precautionary Designation Statement</b> In addition to the designations made under items V-1, V-2 and V-3, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except any designation(s) of the State(s) indicated under item V-6 below. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.		
V-6	<b>Exclusion(s) from precautionary designations</b>	<b>NONE</b>	
VI-1	<b>Priority claim of earlier national application</b>		
VI-1-1	Filing date	<b>21 June 1999 (21.06.1999)</b>	
VI-1-2	Number	<b>991413</b>	
VI-1-3	Country	<b>FI</b>	
VI-2	<b>Priority document request</b> The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s):	<b>VI-1</b>	
VII-1	<b>International Searching Authority Chosen</b>	<b>European Patent Office (EPO) (ISA/EP)</b>	
VIII	<b>Check list</b>	number of sheets	electronic file(s) attached
VIII-1	Request	<b>4</b>	-
VIII-2	Description	<b>9</b>	-
VIII-3	Claims	<b>3</b>	-
VIII-4	Abstract	<b>1</b>	<b>50063.txt</b>
VIII-5	Drawings	<b>4</b>	-
VIII-7	<b>TOTAL</b>	<b>21</b>	
VIII-8	<b>Accompanying items</b>	paper document(s) attached	electronic file(s) attached
VIII-9	Fee calculation sheet	✓	-
VIII-10	Separate signed power of attorney	✓	-
VIII-11	Copy of general power of attorney	✓	-
VIII-16	PCT-EASY diskette	-	<b>diskette</b>
VIII-18	<b>Figure of the drawings which should accompany the abstract</b>	<b>3</b>	
VIII-19	<b>Language of filing of the international application</b>	<b>English</b>	
IX-1	<b>Signature of applicant or agent</b>		
IX-1-1	Name	<b>BERGGREN OY AB</b>	
IX-1-2	Name of signatory	<b>Matti Brax</b>	
IX-1-3	Capacity	<b>Patent Attorney</b>	

## FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	
------	---	--

**PCT REQUEST**

50063

Original (for SUBMISSION) - printed on 21.06.2000 09:56:29 AM

10-2	<b>Drawings:</b>	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	<b>ISA/EP</b>
10-6	Transmittal of search copy delayed until search fee is paid	

**FOR INTERNATIONAL BUREAU USE ONLY**

11-1	Date of receipt of the record copy by the International Bureau	
------	--	--

**PCT (ANNEX - FEE CALCULATION SHEET)**

Original (for SUBMISSION) - printed on 21.06.2000 09:56:29 AM

50063

(This sheet is not part of and does not count as a sheet of the international application)

0	For receiving Office use only International Application No.		
0-1			
0-2	Date stamp of the receiving Office		
0-4	Form - PCT/RO/101 (Annex) PCT Fee Calculation Sheet		
0-4-1	Prepared using	<b>PCT-EASY Version 2.90 (updated 10.05.2000)</b>	
0-9	Applicant's or agent's file reference	<b>50063</b>	
2	Applicant	<b>NOKIA NETWORKS OY, et al.</b>	
12	<b>Calculation of prescribed fees</b>	fee amount/multiplier	total amounts (FIM)
12-1	Transmittal fee	T	⇒ 800
12-2	Search fee	S	⇒ 5 618.71
12-3	International fee Basic fee (first 30 sheets)	b1	2 431.8
12-4	Remaining sheets		0
12-5	Additional amount	(X)	53.51
12-6	Total additional amount	b2	0
12-7	b1 + b2 =	B	2 431.8
12-8	Designation fees Number of designations contained in international application		87
12-9	Number of designation fees payable (maximum 8)		8
12-10	Amount of designation fee	(X)	523.22
12-11	Total designation fees	D	4 185.76
12-12	PCT-EASY fee reduction	R	-749.16
12-13	Total International fee (B+D-R)	I	⇒ 5 868.4
12-14	Fee for priority document Number of priority documents requested		1
12-15	Fee per document	(X)	422
12-16	Total priority document fee	P	⇒ 422
12-17	<b>TOTAL FEES PAYABLE (T+S+I+P)</b>		⇒ 12 709.11
12-19	Mode of payment	<b>cheque</b>	

**VALIDATION LOG AND REMARKS**

13-2-6	Validation messages Contents	Green? Reference number for attached copy of general power of attorney not indicated.
--------	---------------------------------	---

Original (for **SUBMISSION**) - printed on 21.06.2000 09:56:29 AM

### PCT-EASY INFORMATION SHEET

(For applicant use only, DO NOT submit this sheet with the international application)

#### VALIDATION LOG

Green?	Contents
Green?	Reference number for attached copy of general power of attorney not indicated.

Before submitting the International Application, please carefully verify that:

- the information contained on printed Request form is correct;
- Box IX of the Request form has been signed;
- all elements of the international application as indicated in Box VIII of the Request form have been attached; and,
- the diskette containing the PCT-EASY zip file of the International Application has been enclosed and has been clearly labeled "PCT-EASY", with the applicant's or agent's file reference, and the first applicant's name.

#### ATTENTION

DO NOT modify any indications on the Request form printout. The attached PCT-EASY application has been locked. If an error or an omission is discovered at this time, you must copy the submitted application as a template and make the change or correction in a new application (using the submitted application as a template). You may create such a template by copying the submitted application from the "Stored Forms" folder to the "New PCT Forms" folder. Open the new (.OWO) file created in the "New PCT Forms" folder, correct the errors and proceed with the submission process again.

The demand must be filed directly with the competent International Preliminary Examining Authority if two or more Authorities are competent, with the one chosen by the applicant. The name or two-letter code of that Authority may be indicated by the applicant on the line below:  
IPEA/ EP

# PCT

## DEMAND

PCT Chapter II

MU

DGZ

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only

Identification of IPEA	Date of receipt of DEMAND
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION	
International application No. PCT/FI00/00555	International filing date (day/month/year) 21 June 2000 (21.6.00)
(Earliest) Priority date (day/month/year) 21 June 1999 (21.6.99)	
Title of invention Call setup method	
Box No. II APPLICANT(S)	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) NOKIA NETWORKS OY P.O.Box 300, FIN-00045 NOKIA GROUP, Finland	Telephone No.:  Facsimile No.:  Teleprinter No.:
State (that is, country) of nationality: Finland	State (that is, country) of residence: Finland
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) OLKKONEN, Mikko Tähtelänpolku 3, FIN-10210 INKOO, Finland	
State (that is, country) of nationality: Finland	State (that is, country) of residence: Finland
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) HARNO, Jarmo Hiidenportti 12 B, FIN-02750 ESPOO, Finland	
State (that is, country) of nationality:	State (that is, country) of residence:
<input type="checkbox"/> Further applicants are indicated on a continuation sheet.	

**Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE**

The following person is  agent  common representative

and  has been appointed earlier and represents the applicant(s) also for international preliminary examination.

is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.

is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

BERGGREN OY AB  
P.O. Box 16, FIN-00101 HELSINKI, Finland

Telephone No.:

+358 9 693 701

Facsimile No.:

+358 9 693 3944

Teleprinter No.:

Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION****Statement concerning amendments:\***

1. The applicant wishes the international preliminary examination to start on the basis of:

the international application as originally filed

the description  as originally filed

as amended under Article 34

the claims  as originally filed

as amended under Article 19 (together with any accompanying statement)

as amended under Article 34

the drawings  as originally filed

as amended under Article 34

2.  The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.

3.  The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

\* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English

which is the language in which the international application was filed.

which is the language of a translation furnished for the purposes of international search.

which is the language of publication of the international application.

which is the language of the translation (to be) furnished for the purposes of international preliminary examination.

**Box No. V ELECTION OF STATES**

The applicant hereby elects all eligible States *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following States which the applicant wishes not to elect:

**Box No. VI CHECK LIST**

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

1. translation of international application	:	sheets
2. amendments under Article 34	:	sheets
3. copy (or, where required, translation) of amendments under Article 19	:	sheets
4. copy (or, where required, translation) of statement under Article 19	:	sheets
5. letter	:	sheets
6. other (specify)	:	sheets

For International Preliminary Examining Authority use only

received      not received

<input type="checkbox"/>	<input type="checkbox"/>

The demand is also accompanied by the item(s) marked below:

1. <input checked="" type="checkbox"/> fee calculation sheet	4. <input type="checkbox"/> statement explaining lack of signature
2. <input type="checkbox"/> separate signed power of attorney	5. <input type="checkbox"/> nucleotide and or amino acid sequence listing in computer readable form
3. <input type="checkbox"/> copy of general power of attorney; reference number, if any:	6. <input type="checkbox"/> other (specify):

**Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE**

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

BERGGREN OY AB

*Sirpa Kuisma*

Sirpa Kuisma  
Patent Agent

HELSINKI, Finland 15 January 2001

**For International Preliminary Examining Authority use only**

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3.  The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply.

The applicant has been informed accordingly.

4.  The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5.  Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

**For International Bureau use only**

Demand received from IPEA on:

## FEE CALCULATION SHEET

## Annex to the Demand for international preliminary examination

International application No. PCT/FI00/00555

For International Preliminary Examining Authority use only

Applicant's or agent's file reference 50063/SKU/PKK

Date stamp of the IPEA

Applicant

NOKIA NETWORKS OY

## Calculation of prescribed fees

1. Preliminary examination fee .....

EUR 1533

P

2. Handling fee (*Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.*) .....

EUR 147

H

3. Total of prescribed fees

Add the amounts entered at P and H and enter total in the TOTAL box .....

EUR 1680

TOTAL

## Mode of Payment

authorization to charge deposit account with the IPEA (see below)  
 cheque  
 postal money order  
 bank draft

 cash revenue stamps coupons other (specify):Bank transfer to account  
157230-340380Deposit Account Authorization (*this mode of payment may not be available at all IPEAs*)The IPEA/  is hereby authorized to charge the total fees indicated above to my deposit account. (*this check-box may be marked only if the conditions for deposit accounts of the IPEA so permit*) is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account.

Deposit Account Number

Date (day/month/year)

Signature

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL SEARCH REPORT  
OR THE DECLARATION

(PCT Rule 44.1)

To:  
BERGGREN OY AB  
P.O. Box 16  
FIN-00101 Helsinki  
FINLAND

*Berggren Oy Ab*

16 -10- 2000

Applicant's or agent's file reference  
50063

International application No.  
PCT/ FI 00/ 00555

Applicant

NOKIA NETWORKS OY

Date of mailing  
(day/month/year)

12/10/2000

FOR FURTHER ACTION

See paragraphs 1 and 4 below

International filing date  
(day/month/year)

21/06/2000

*Rec  
12/12/00  
kog. dual. 21/2/00  
Ley*

1.  The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

**Filing of amendments and statement under Article 19:**

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

**When?** The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

**Where?** Directly to the International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland  
Facsimile No.: (41-22) 740.14.35

**For more detailed instructions, see the notes on the accompanying sheet.**

2.  The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3.  With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority  
European Patent Office, P.B. 5818 Patentlaan 2  
NL-2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Carole Emery

## NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

### INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

#### What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

**When?** Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

#### Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

**How?** Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

**The amendments must be made in the language in which the international application is to be published.**

#### What documents must/may accompany the amendments?

**Letter (Section 205(b)):**

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

**The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.**

## NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

**The following examples illustrate the manner in which amendments must be explained in the accompanying letter:**

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:  
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:  
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:  
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or  
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:  
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

### "Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

**It must be in the language in which the international application is to be published.**

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

### Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

### Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

14

Applicant's or agent's file reference 50063	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/FI00/00555	International filing date (day/month/year) 21/06/2000	Priority date (day/month/year) 21/06/1999
International Patent Classification (IPC) or national classification and IPC H04L12/66		
<p>Applicant NOKIA NETWORKS OY</p> <p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 6 sheets.</p>		
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li>I    <input checked="" type="checkbox"/> Basis of the report</li> <li>II    <input type="checkbox"/> Priority</li> <li>III    <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li>IV    <input type="checkbox"/> Lack of unity of invention</li> <li>V    <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li>VI    <input type="checkbox"/> Certain documents cited</li> <li>VII    <input checked="" type="checkbox"/> Certain defects in the international application</li> <li>VIII    <input type="checkbox"/> Certain observations on the international application</li> </ul>		

Date of submission of the demand 15/01/2001	Date of completion of this report 20.09.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Hamer, J Telephone No. +49 89 2399 8827



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/FI00/00555

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, pages:**

1,4-8	as originally filed		
2,2a,3,9	as received on	16/08/2001 with letter of	13/08/2001

**Claims, No.:**

16-19	as originally filed		
1-15	as received on	16/08/2001 with letter of	13/08/2001

**Drawings, sheets:**

1/4-4/4	as originally filed
---------	---------------------

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/FI00/00555

4. The amendments have resulted in the cancellation of:

the description,      pages:  
 the claims,      Nos.:  
 the drawings,      sheets:

5.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes:	Claims	1-19
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-19
	No:	Claims	

Industrial applicability (IA)      Yes:      Claims      1-19  
                                        No:      Claims

2. Citations and explanations  
**see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/FI00/00555

**V- Reasoned Statement**

**1. Claim 1**

The subject-matter of claim 1 of the present invention is concerned with a method for optimizing data transmission in a telephone network. In particular, the claim is concerned with connections through a packet network which is also connected to a switching network. A call may pass through many switching elements in a network, but some legs of the connection may use Internet or other network telephony protocols through a packet switched network. The reason for this may be cost. If a packet switched call arrives at a switching network node and is rerouted by this switching node back into the packet network, this can be an inefficient use of resources.

Internet telephony is known per se in the prior art. The above mentioned problem is not found in any of the available prior art documents. Of these, WO 99 14929 A1 (MEDIATRIX PERIPHERALS INC.) 25 March 1999 routes calls to a packet switched network according to pre-determined rules. WO 99 04540 A1 (MADGE NETWORKS LTD.) 28 January 1999 also deals with Internet telephony and is only concerned with the two end points of the call. A packet switched circuit is set up in a packet network between these two points. WO 97 16007 A1 (TELECOM FINLAND OY) 1 May 1997 is concerned with a gateway between a telephone network and a packet network. No mention of nodes at different points along the way is made.

In claim 1, the problem is solved by an intermediate node of a telephone network checking if both incoming and outgoing legs of the connection are packet switched. If this is the case (meaning that the intermediate circuit switched node is not required), it indicates to one of the originating or destination packet switch nodes the packet switched network address of its counterpart. The advantage of this is that the circuit switched node need no longer be part of the connection, leading to greater efficiency for the data transfer.

The remainder of the documents found in the international search report deal with background art only. The features of claim 1 are not found in any of the available

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

---

International application No. PCT/FI00/00555

documents, not even in combination. As a result, claim 1 involves an inventive step and meets the requirements of Article 33(3) PCT.

**2. Independent claim 14**

The subject-matter of independent claim 14 is essentially the same as that of claim 1, but expressed in terms of apparatus features. Thus for the same reasons outlined above, claim 14 also meets the requirements of Articles 33(2) and (3) PCT.

**3. Dependent claims 2 to 13 and 15 to 19**

The subject-matter of dependent claims 2 to 13 and 15 to 19 includes features which further restrict the scope of claims 1 and 14 respectively. As a result, these claims also meet the requirements of Articles 33(2) and (3) PCT.

**VII- Certain Defects**

The words "spirit and" should be deleted from the last line of the description as they render the scope of monopoly protection desired unclear (see PG-III,4.3a).

REPLACED BY  
ART 94 AMDT

for transmitting voice using so called internet telephony. As the data transmission capacity of the Internet increases, the use of Internet as a replacement of conventional telephones will become common. Some telephone operators already provide long distance calls via the Internet with a reduced rate.

5     Figure 1 illustrates one possible arrangement for transmission of speech using an IP network together with a telephone network. Figure 1 shows switching elements 10a, 10b, 10c of the telephone network being connected to each other with PCM communication links 12. Further, figure 1 shows an IP network 40, and routers 30 connected to the IP network. Network elements such as IP gateways 20 connect the  
10 switching elements 10a, 10b, 10c to the routers 30. Without using the IP network, speech data from a first party PARTY A of a connection to a second party PARTY B is transferred using the PCM connections 12. The call may pass through a large number of switching elements, depending on the geographical distance spanned by the call. When the IP network 40, such as the Internet network is used, a switching  
15 element directs the speech data to an IP gateway instead of another switching element, and the IP gateway sends the speech data through the IP network to distant IP gateway connected to a distant switch element. The distant IP gateway converts the received IP packets to a speech data stream and forwards the data stream to the distant switch element for further processing. One or more legs of a call may be  
20 routed in such a way through an IP network.

One example of the proceeding of call setup according to prior art is illustrated in figure 2. Figure 2 shows the local telephone exchange 5 of a calling party PARTY A and switching elements 10a, 10b, 10c of the telephone network. First, the calling party initiates the call, whereby the local telephone exchange sends 100 an ISUP SETUP message to the next switching element 10a. The switching element 10a performs digit analysis 105 to determine, where the call should be directed. In this example, the digit analysis reveals, that the next switching element SW B 10b is an IP capable switch. As a consequence, switching element SW A 10a sends an ISUP SETUP message 110 to switching element SW B 10b. The switching element SW A  
25 10a may include in the message an indication that it wishes to set up an IP connection, for example as a parameter specifying an IP address corresponding to the IP gateway of switch element SW A. The switching element SW B 10b responds by sending 115 a message such as a CHANNEL INFO message specifying an IP address corresponding to the IP gateway connected to switch element SW B. After  
30 receiving the IP address, switching element SW A may start sending 120 speech data to switching element B via the IP gateways and the IP network. After sending  
35

the CHANNEL INFO message, the switching element SW B performs digit analysis 125 to determine, where it should direct the call. In this example, the digit analysis reveals that the next switching element is switching element SW C 10c, and that SW C is IP capable. As a consequence, switching element SW B 10b sends an ISUP 5 SETUP message 130 to switching element SW C 10c. The switching element SW B 10b may include in the message an indication that it wishes to set up an IP connection, for example as a parameter specifying an IP address corresponding to the IP gateway of switch element SW B. The switching element SW C 10c responds by sending 135 a message such as a CHANNEL INFO message specifying an IP 10 address corresponding to the IP gateway connected to switch element SW C. After receiving the IP address, switching element SW B may start sending 140 speech data to switching element C via the IP gateways and the IP network.

The resulting situation is not optimal regarding the efficiency of data transfer: swiching element SW B receives a speech data stream from the IP network, and 15 returns the speech data stream back to the network for forwarding to switching element SW C.

The same situation may occur also in a cellular telecommunication network, in which case the switching elements 10a, 10b, 10c are switching elements of a cellular telecommunications network, such as mobile services switching centers 20 (MSC) of a GSM (Global System for Mobile communications) or a UMTS (Universal Mobile Telecommunication System) network. In a cellular telecommunication network such a situation may also occur as a result of a inter MSC handover, for example when a mobile station (MS) under control of MSC SW B moves to an area under control of MSC SW C, while having a connection to a 25 mobile station under control of MSC SW A.

#### SUMMARY OF THE INVENTION

An object of the invention is to realize a method, which alleviates the problems associated with prior art. A further object of the invention is to realize such a method with minimal changes to existing protocols.

30 The objects are reached by arranging a switching element to monitor the connections, and initiate a connection release procedure, when it observes that both the incoming and outgoing leg of a connection are transmitted via a packet data network. The switching element also indicates to the originating switching element

advantageous in terms of ease of control of connections, and allows all control functions of the circuit switched network such as billing to be used despite the use of a packet data network as a part of the data transfer route.

The term user data connection in the attached patent claims therefore covers the  
5 user data connection in such systems, in which user data connections and control  
connections are separate. Further, the term user data connection covers the trans-  
mitted connection in systems, in which there is no separation between the payload  
and control aspects of a connection. Further, the user data connection can transfer  
speech data, images, video data, fax data, or any other type of data transferred in a  
10 circuit switched connection.

In this specification and in the attached patent claims, the term leg of a connection  
refers to a part of a connection from one switching element of a telephone network  
to another.

The IP addresses used in various embodiments of the invention may be IPv4  
15 addresses described in detail in the specification RFC 791, or IPv6 addresses  
described in the specification RFC 1883. The invention can be used with both IP  
version 4 and IP version 6 networks, as well as other packet data networks.

The name of a given functional entity, such as the base station controller, is often  
20 different in the context of different cellular telecommunication systems. For  
example, in the UMTS (Universal Mobile Telecommunication System) system the  
functional entity corresponding to a base station controller (BSC) is the radio  
network controller (RNC). Therefore, the particular terminology used to denote  
various functional entities in this specification are only examples according to the  
GSM system, and do not limit the invention in any way. Further, the various  
25 command and message names such as the CHANNEL INFO message name are  
intended to be examples only, and the invention is not limited to using the command  
and message names recited in this specification.

In view of the foregoing description it will be evident to a person skilled in the art  
that various modifications may be made within the scope of the invention. While a  
30 preferred embodiment of the invention has been described in detail, it should be  
apparent that many modifications and variations thereto are possible, all of which  
fall within the true spirit and scope of the invention.

**Claims**

1. Method for optimizing data transmission in a telephone network, characterized in that the method comprises at least steps, in which
  - a first switching network element examines, if the incoming leg of a user data connection is transmitted from a second switching network element via a packet data network and if the outgoing leg of the same user data connection is transmitted to a third switching network element via said packet data network,
  - if both the incoming and the outgoing legs are transmitted via said packet data network, said first switching network element indicates to one of said second and third switching network elements an address of said packet data network corresponding to the other of said second and third switching network elements.
2. A method according to claim 1, characterized in that the method further comprises a step, in which said first switching network element releases the user data connection between said first switching network element and said one of said second and third switching network elements.
3. A method according to claim 1, characterized in that said one of said second and third switching network elements is said second switching network element and said other of said second and third switching network elements is said third switching network element.
4. A method according to claim 1, characterized in that said packet data network is an IP network and said address of said packet data network is an IP address.
5. A method according to claim 4, characterized in that said address of said packet data network is an IPv4 address according to RFC 791.
6. A method according to claim 4, characterized in that said address of said packet data network is an IPv6 address according to RFC 1883.
7. A method according to claim 1, characterized in that said address corresponding to said one of said second and third switching network elements is indicated to said other of said second and third switching network elements switching element using a call control release message.

8. A method according to claim 7, characterized in that said indication is attached to a ISUP RELEASE message.
9. A method according to claim 1, characterized in that said connection is a speech data connection.
- 5 10. A method according to claim 1, characterized in that said switching network element is a network element of a cellular telecommunications network.
11. A method according to claim 1, characterized in that said switching network element is a MSC of a cellular telecommunications network.
- 10 12. A method according to claim 11, characterized in that said switching network element is a MSC of a GSM network.
13. A method according to claim 11, characterized in that said switching network element is a MSC of a UMTS network.
14. A switching network element of a telephone network, characterized in that the network element comprises at least
  - 15 - means for examining the incoming and outgoing legs of connections and for producing an output if both said legs of a connection are transmitted via a packet data network instead of a circuit-switched connection,
  - means for indicating a packet data network address corresponding to one of the switching network element at the receiving end of said outgoing leg and the switching network element at the originating end of said incoming leg to the other of the switching network element at the receiving end of said outgoing leg and the switching network element at the originating end of said incoming leg as a response to said output, and
  - 20 - means for sending a connection release message as a response to said output to said one of the switching network element at the receiving end of said outgoing leg and the switching network element at the originating end of said incoming leg.
- 25 15. A switching network element according to claim 14, characterized in that said one of the switching network element at the receiving end of said outgoing leg and the switching network element at the originating end of said incoming leg is the switching network element at the receiving end of said outgoing leg; and said other of the switching network element at the receiving end of said outgoing leg and the switching network element at the originating end of said incoming leg is the switching network element at the originating end of said incoming leg.

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/FI 00/00555

## A. CLASSIFICATION OF SUBJECT MATTER

**IPC7: H04L 12/66, H04M 3/42**

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

**IPC7: H04L, H04M, H04Q**

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 9914929 A1 (MEDIATRIX PERIPHERALS INC.), 25 March 1999 (25.03.99), page 14, line 5 - page 15, line 21, claims 1-9, abstract  --	1-19
Y	WO 9904540 A1 (MADGE NETWORKS LTD.), 28 January 1999 (28.01.99), page 3, line 6 - page 5, line 28, claims 1-7, abstract  --	1-19
Y	WO 9716007 A1 (TELECOM FINLAND OY), 1 May 1997 (01.05.97), see the whole document  --	1-19

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document but published on or after the international filing date	"Y"	document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

18 Sept 2000

Date of mailing of the international search report

12 10 2000

Name and mailing address of the International Searching Authority  
European Patent Office P.B. 5818 Patentstaan 2  
NL-2280 HV Rijswijk  
Tel(+31-70)340-2040, Tx 31 651 epo nl  
Fax(+31-70)340-3016

Authorized officer

Roger Bou Faisal/LR  
Telephone No.

# INTERNATIONAL SEARCH REPORT

2

International application No.

PCT/FI 00/00555

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9920060 A1 (DSC TELECOM L.P.), 22 April 1999 (22.04.99), page 5, line 2 - page 13, line 27, abstract --	1-19
A	EP 0909064 A2 (KOKUSAI DENSHIN DENWA CO., LTD.), 14 April 1999 (14.04.99), claims 1-10, abstract --	1,14
A	WO 9811704 A2 (DIALNET, INC.), 19 March 1998 (19.03.98), claims 1-14, abstract --	1,14
A	WO 9929123 A2 (TELEFONAKTIEBOLAGET LM ERICSSON), 10 June 1999 (10.06.99), claims 1-4, abstract -- -----	1,14

# INTERNATIONAL SEARCH REPORT

Information on patent family members

01/08/00

International application No.

PCT/FI 00/00555

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
WO 9914929	A1	25/03/99	AU EP	9149098 A 1016260 A	05/04/99 05/07/00	
WO 9904540	A1	28/01/99	EP GB	0997021 A 9714793 D	03/05/00 00/00/00	
WO 9716007	A1	01/05/97	AU FI FI	7302596 A 955093 D 955810 A	15/05/97 00/00/00 26/04/97	
WO 9920060	A1	22/04/99	AU EP	9514398 A 1020088 A	03/05/99 19/07/00	
EP 0909064	A2	14/04/99	JP	11068851 A	09/03/99	
WO 9811704	A2	19/03/98	AU	4353097 A	02/04/98	
WO 9929123	A2	10/06/99	AU NO	1264799 A 975518 A	16/06/99 02/06/99	

## PATENT COOPERATION TREATY

PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>50063</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/ FI 00/ 00555</b>	International filing date (day/month/year) <b>21/06/2000</b>	(Earliest) Priority Date (day/month/year) <b>21/06/1999</b>
Applicant <b>NOKIA NETWORKS OY</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing :

contained in the international application in written form.

filed together with the international application in computer readable form.

furnished subsequently to this Authority in written form.

furnished subsequently to this Authority in computer readable form.

the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2.  Certain claims were found unsearchable (See Box I).

3.  Unity of invention is lacking (see Box II).

4. With regard to the title,

the text is approved as submitted by the applicant.

the text has been established by this Authority to read as follows:

5. With regard to the abstract,

the text is approved as submitted by the applicant.

the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

as suggested by the applicant.

because the applicant failed to suggest a figure.

because this figure better characterizes the invention.

3

None of the figures.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 00/00555

## A. CLASSIFICATION OF SUBJECT MATTER

**IPC7: H04L 12/66, H04M 3/42**

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

**IPC7: H04L, H04M, H04Q**

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 9914929 A1 (MEDIATRIX PERIPHERALS INC.), 25 March 1999 (25.03.99), page 14, line 5 – page 15, line 21, claims 1-9, abstract  --	1-19
Y	WO 9904540 A1 (MADGE NETWORKS LTD.), 28 January 1999 (28.01.99), page 3, line 6 – page 5, line 28, claims 1-7, abstract  --	1-19
Y	WO 9716007 A1 (TELECOM FINLAND OY), 1 May 1997 (01.05.97), see the whole document  --	1-19

 Further documents are listed in the continuation of Box C. See patent family annex.

\* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"I" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"V" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

18 Sept 2000

12.10.2000

Name and mailing address of the International Searching Authority  
 European Patent Office P.B. 5818 Patentlaan 2  
 NL-2280 HV Rijswijk  
 Tel(+31-70)340-2040, Tx 31 651 epo nl,  
 Fax(+31-70)340-3016

Authorized officer

Roger Bou Faisal/LR  
 Telephone No.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 00/00555

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9920060 A1 (DSC TELECOM L.P.), 22 April 1999 (22.04.99), page 5, line 2 - page 13, line 27, abstract --	1-19
A	EP 0909064 A2 (KOKUSAI DENSHIN DENWA CO., LTD.), 14 April 1999 (14.04.99), claims 1-10, abstract --	1,14
A	WO 9811704 A2 (DIALNET, INC.), 19 March 1998 (19.03.98), claims 1-14, abstract --	1,14
A	WO 9929123 A2 (TELEFONAKTIEBOLAGET LM ERICSSON), 10 June 1999 (10.06.99), claims 1-4, abstract -----	1,14

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

01/08/00

International application No.

PCT/FI 00/00555

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
WO 9914929	A1	25/03/99	AU EP	9149098 A 1016260 A		05/04/99 05/07/00
WO 9904540	A1	28/01/99	EP GB	0997021 A 9714793 D		03/05/00 00/00/00
WO 9716007	A1	01/05/97	AU FI FI	7302596 A 955093 D 955810 A		15/05/97 00/00/00 26/04/97
WO 9920060	A1	22/04/99	AU EP	9514398 A 1020088 A		03/05/99 19/07/00
EP 0909064	A2	14/04/99	JP	11068851 A		09/03/99
WO 9811704	A2	19/03/98	AU	4353097 A		02/04/98
WO 9929123	A2	10/06/99	AU NO	1264799 A 975518 A		16/06/99 02/06/99

13 August 2001

European Patent Office  
D-80298 München  
Germany

FAX: (7 pages)  
999-49-89 2399 4465  
(Confirmation by mail)

Authorized Officer: Hamer, J  
Our ref: 50063/SKU/PKK

**REPLY TO WRITTEN OPINION**  
**INTERNATIONAL PATENT APPLICATION PCT/FI00/00555**  
**APPLICANT: NOKIA NETWORKS OY**  
**Due Date: 14 August 2001**

• HYDROLYSIS/SMALL INDUSTRIES  
 • PATENTS,  
 UTILITY MODELS  
 J. Kupiainen  
 M. Brax  
 E. Heikkilä  
 T. Laaks  
 B. Lässerius  
 T. Palin  
 I. Risku  
 O.-P. Sajjonmaa  
 J. Svensson  
 P. Tahmua  
 B. Friskman  
 J. Jorenien  
 M. Karttunen  
 S. Kuusma  
 M. Luajalahti  
 V. Tognetti  
 S. Ylätalo  
 • MALLIP  
 • DESIGNS  
 M. Mikander  
 L. Valjakka  
 • TAVARAMERKIT,  
 LAKIASIAT  
 • TRADEMARKS,  
 LEGAL MATTERS:  
 P. Kolve  
 H. Halmetoja  
 S. Henn  
 J. Karlsson  
 E.-M. Söderström  
 S. Aspola  
 J. Talvitie

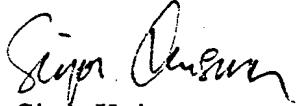
In response to the Written Opinion the application is amended as follows.

The enclosed claims 1-15 are otherwise original, but they contain reference signs. Reference signs are not added to claims 16-19, so a replacement page is not enclosed for these claims.

The documents cited in the International Search Report are briefly discussed on replacement page 2.

A spelling mistake is corrected (switching instead of swiching) on page 3, row 14. On page 9, the last sentence is modified to refer to the appended claims.

**BERGGREN OY AB**

  
 Sirpa Kuisma  
 Patent Attorney

Encls. Replacement pages 2, 2a, 3, 9, 10 and 11

**Berggren Oy Ab**

Osoite • Address:

PL 16 • P.O.Box 16  
FIN-00101 Helsinki:

<sup>\*\*European Patent Attorney</sup>  
<sup>\*\*European Trademark Attorney,</sup>

Käyntiosoite • Office:

Graniittitalo  
Jaakonkatu 3 A  
Helsinki

Nat. +358 9 693 701  
Int. +358 9 693 701  
Fax +358 9 693 3941



email:bcx@berggren.fi  
http://www.berggren.fi

Pankit • Bankers:

NORDEA 157330-15411  
SWIFT MRITFIHH  
SAMPO 800017-90104  
SWIFT PSPEFIHH

Yhtiö • Company:

Krnro 30.302  
Trade Reg. No. 30.302  
Y 0107002-7  
VAT E.01070027  
Kotipaikka Helsinki

for transmitting voice using so called internet telephony. As the data transmission capacity of the Internet increases, the use of Internet as a replacement of conventional telephones will become common. Some telephone operators already provide long distance calls via the Internet with a reduced rate.

5 Publication WO 9914929 discloses method and apparatus for placing long distance telephone calls via a packet data network and local telephone calls via local telephone network, the user of the telephone set plainly dialling the desired destination number. The routing of the call via either packet data network or telephone network is based on the destination number.

10

Publication WO 9904540 discloses a system for establishing communication between two endpoints connected to each other via two communication media, for example Ethernet and ATM (Asynchronous Transfer Mode), operating in accordance with different communication protocols. A connection controller selects a connection path connecting the two endpoints and configures the endpoints and an interface between the two communication media to establish a connection before any data is sent using the connection path.

15

Publication WO 9716007 discloses a telecommunication system, where it is possible to transmit calls between terminals using a packet switched network or a packet switched network and telephone network. There is a gateway connecting a packet switched network to telephone network. A first connection is typically set up between a first terminal and the gateway via, for example, the packet switched network and a second connection is set up between a second terminal and the gateway via the telephone network.

25

Figure 1 illustrates one possible arrangement for transmission of speech using an IP network together with a telephone network. Figure 1 shows switching elements 10a, 10b, 10c of the telephone network being connected to each other with PCM communication links 12. Further, figure 1 shows an IP network 40, and routers 30 connected to the IP network. Network elements such as IP gateways 20 connect the switching elements 10a, 10b, 10c to the routers 30. Without using the IP network, speech data from a first party PARTY A of a connection to a second party PARTY B is transferred using the PCM connections 12. The call may pass through a large number of switching elements, depending on the geographical distance spanned by the call. When the IP network 40, such as the Internet network is used, a switching element directs the speech data to an IP gateway instead of another switching element, and the IP gateway sends the speech data through the IP network to distant IP gateway connected to a distant switch element. The distant IP gateway converts the received IP packets to a speech data stream and forwards the data stream to the distant switch element for further processing. One or more legs of a call may be routed in such a way through an IP network.

One example of the proceeding of call setup according to prior art is illustrated in figure 2. Figure 2 shows the local telephone exchange 5 of a calling party PARTY A and switching elements 10a, 10b, 10c of the telephone network. First, the calling party initiates the call, whereby the local telephone exchange sends 100 an ISUP SETUP message to the next switching element 10a. The switching element 10a performs digit analysis 105 to determine, where the call should be directed. In this example, the digit analysis reveals, that the next switching element SW B 10b is an IP capable switch. As a consequence, switching element SW A 10a sends an ISUP SETUP message 110 to switching element SW B 10b. The switching element SW A 10a may include in the message an indication that it wishes to set up an IP connection, for example as a parameter specifying an IP address corresponding to the IP gateway of switch element SW A. The switching element SW B 10b responds by sending 115 a message such as a CHANNEL INFO message specifying an IP address corresponding to the IP gateway connected to switch element SW B. After receiving the IP address, switching element SW A may start sending 120 speech data to switching element B via the IP gateways and the IP network. After sending

the CHANNEL INFO message, the switching element SW B performs digit analysis 125 to determine, where it should direct the call. In this example, the digit analysis reveals that the next switching element is switching element SW C 10c, and that SW C is IP capable. As a consequence, switching element SW B 10b sends an ISUP 5 SETUP message 130 to switching element SW C 10c. The switching element SW B 10b may include in the message an indication that it wishes to set up an IP connection, for example as a parameter specifying an IP address corresponding to the IP gateway of switch element SW B. The switching element SW C 10c responds by sending 135 a message such as a CHANNEL INFO message specifying an IP 10 address corresponding to the IP gateway connected to switch element SW C. After receiving the IP address, switching element SW B may start sending 140 speech data to switching element C via the IP gateways and the IP network.

The resulting situation is not optimal regarding the efficiency of data transfer: 15 switching element SW B receives a speech data stream from the IP network, and returns the speech data stream back to the network for forwarding to switching element SW C.

The same situation may occur also in a cellular telecommunication network, in which case the switching elements 10a, 10b, 10c are switching elements of a cellular telecommunications network, such as mobile services switching centers (MSC) of a 20 GSM (Global System for Mobile communications) or a UMTS (Universal Mobile Telecommunication System) network. In a cellular telecommunication network such a situation may also occur as a result of a inter MSC handover, for example when a mobile station (MS) under control of MSC SW B moves to an area under control of MSC SW C, while having a connection to a mobile station under control of MSC 25 SW A.

## SUMMARY OF THE INVENTION

An object of the invention is to realize a method, which alleviates the problems associated with prior art. A further object of the invention is to realize such a method with minimal changes to existing protocols.

30 The objects are reached by arranging a switching element to monitor the connections, and initiate a connection release procedure, when it observes that both the incoming and outgoing leg of a connection are transmitted via a packet data network. The switching element also indicates to the originating switching element

advantageous in terms of ease of control of connections, and allows all control functions of the circuit switched network such as billing to be used despite the use of a packet data network as a part of the data transfer route.

The term user data connection in the attached patent claims therefore covers the user data connection in such systems, in which user data connections and control connections are separate. Further, the term user data connection covers the transmitted connection in systems, in which there is no separation between the payload and control aspects of a connection. Further, the user data connection can transfer speech data, images, video data, fax data, or any other type of data transferred in a circuit switched connection.

In this specification and in the attached patent claims, the term leg of a connection refers to a part of a connection from one switching element of a telephone network to another.

The IP addresses used in various embodiments of the invention may be IPv4 addresses described in detail in the specification RFC 791, or IPv6 addresses described in the specification RFC 1883. The invention can be used with both IP version 4 and IP version 6 networks, as well as other packet data networks.

The name of a given functional entity, such as the base station controller, is often different in the context of different cellular telecommunication systems. For example, in the UMTS (Universal Mobile Telecommunication System) system the functional entity corresponding to a base station controller (BSC) is the radio network controller (RNC). Therefore, the particular terminology used to denote various functional entities in this specification are only examples according to the GSM system, and do not limit the invention in any way. Further, the various command and message names such as the CHANNEL INFO message name are intended to be examples only, and the invention is not limited to using the command and message names recited in this specification.

In view of the foregoing description it will be evident to a person skilled in the art that various modifications may be made within the scope of the invention. While a preferred embodiment of the invention has been described in detail, it should be apparent that many modifications and variations thereto are possible, all of which fall within the true spirit and scope of the invention as defined in the appended claims.

## Claims

1. Method for optimizing data transmission in a telephone network, characterized in that the method comprises at least steps, in which
  - a first switching network element (10b) examines (200, 305, 310), if the incoming leg of a user data connection is transmitted from a second switching network element (10a) via a packet data network and if the outgoing leg of the same user data connection is transmitted to a third switching network element (10c) via said packet data network,
  - if both the incoming and the outgoing legs are transmitted via said packet data network, said first switching network element indicates (210, 320) to one of said second and third switching network elements an address of said packet data network corresponding to the other of said second and third switching network elements.
- 10 2. A method according to claim 1, characterized in that the method further comprises a step, in which said first switching network element releases (240, 325) the user data connection between said first switching network element and said one of said second and third switching network elements.
- 15 3. A method according to claim 1, characterized in that said one of said second and third switching network elements is said second switching network element and  
20 said other of said second and third switching network elements is said third switching network element.
4. A method according to claim 1, characterized in that said packet data network is an IP network and said address of said packet data network is an IP address.
- 25 5. A method according to claim 4, characterized in that said address of said packet data network is an IPv4 address according to RFC 791.
6. A method according to claim 4, characterized in that said address of said packet data network is an IPv6 address according to RFC 1883.
- 30 7. A method according to claim 1, characterized in that said address corresponding to said one of said second and third switching network elements is indicated to said other of said second and third switching network elements switching element using (210) a call control release message.

8. A method according to claim 7, **characterized** in that said indication is attached (210) to a ISUP RELEASE message.
9. A method according to claim 1, **characterized** in that said connection is a speech data connection.
- 5 10. A method according to claim 1, **characterized** in that said switching network element is a network element of a cellular telecommunications network.
11. A method according to claim 1, **characterized** in that said switching network element is a MSC of a cellular telecommunications network.
- 10 12. A method according to claim 11, **characterized** in that said switching network element is a MSC of a GSM network.
13. A method according to claim 11, **characterized** in that said switching network element is a MSC of a UMTS network.
14. A switching network element (400) of a telephone network, **characterized** in that the network element comprises at least
  - 15 - means (453) for examining the incoming and outgoing legs of connections and for producing an output if both said legs of a connection are transmitted via a packet data network instead of a circuit-switched connection,
  - means (454) for indicating a packet data network address corresponding to one of the switching network element at the receiving end of said outgoing leg and the switching network element at the originating end of said incoming leg to the other of the switching network element at the receiving end of said outgoing leg and the switching network element at the originating end of said incoming leg as a response to said output, and
  - means (455) for sending a connection release message as a response to said output to said one of the switching network element at the receiving end of said outgoing leg and the switching network element at the originating end of said incoming leg.
- 25 15. A switching network element according to claim 14, **characterized** in that said one of the switching network element at the receiving end of said outgoing leg and the switching network element at the originating end of said incoming leg is the switching network element at the receiving end of said outgoing leg; and said other of the switching network element at the receiving end of said outgoing leg and the switching network element at the originating end of said incoming leg is the switching network element at the originating end of said incoming leg.